Space Weather Forecast

Issued on Tuesday, 06 December 2022 at 13:42 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class activity throughout. Chance of Minor Geomagnetic Storm G1 7-8 Dec.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with occasional small common-class X-ray flares observed. These peaked at 05/1701UTC from a developing sunspot in the central northern hemisphere. This was one of up to seven sunspot regions on the Earth-facing side of the Sun, with the disc dominated by a large region in the southeast which showed some growth in its intermediate spots. The remaining spots on the have shown little growth and remained relatively stable with one small spot fading entirely.
Two minor disturbances were observed on solar imagery in the northeastern quadrant of the Earth-facing side of the Sun. However, there was no evidence of any Earth-bound Coronal Mass Ejections (CMEs) in available satellite imagery.

Solar Wind / Geomagnetic Activity: Solar winds were suggestive of a gradual exit from a recent fast wind.
The solar wind speed showed a gradual decline from Elevated to Slow-Low levels in the period. The number of particles in the solar wind showed a similar decline to background counts. The important north-south component was generally weak.
Resultant geomagnetic activity was Quiet throughout (Kp 0-2).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to remain at Low levels, with occasional Common-class flares. There is a daily Chance of isolated moderate-class flares, perhaps most likely from the two largest sunspot regions. However, the complexity of the current sunspots has not been reflected in their observed flare activity. No significant regions arrive or depart in the four days.

Solar Wind / Geomagnetic Activity: No Earth-directed components of CMEs feature in the current forecast.
Solar winds are in gradual decline. Enhancement of winds is expected later on Day 2 (7 Dec) upon the arrival of coronal hole fast winds. Winds expected to ease by the end of the period as this influence wanes. Geomagnetic activity is expected to remain Quiet (Kp 0-2) during the next 24-hours with a chance of Unsettled intervals (Kp 3). Active intervals (Kp 4) likely from late Day 2 with a Chance of G1/Minor Storms spanning late Day 2 and Day 3 (7-8 Dec). Activity then expected to return to Quiet as connection to coronal hole fast wind stream weakens.

Energetic Particles / Solar Radiation: No solar radiation storms are expected given the observed lack of even modest X-ray flares.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	30	30	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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